fined, together with a portion of calcareous rock; yet though such direct proofs are wanting, he considers the collateral evidence as quite satisfactory in proving that a true solvent power over calcareous matter is exerted by those animals.

An Account of some Experiments relative to the Passage of radiant Heat through glass Screens. By the Rev. Baden Powell, *M.A. F.R.S. of Oriel College, Oxford. Communicated March* 9, 1826. Read June 1, 1826. [*Phil. Trans.* 1826, *p.* 372.]

The object of this paper is to examine the correctness and the consequences of a conclusion of De la Roche, that if radiant heat be intercepted by two transparent screens, the additional diminution of effect occasioned by the second is proportionally much less than that produced by the first, and so for any number of screens. This M. De la Roche explains by supposing the heat passing through the first screens to acquire thereby a kind of polarization, which enables it to pass the rest more easily. The author, however, observes, that when the temperature of the source of heat is above incandescence, the fact admits of more simple explanation, by regarding the heat as consisting of two portions, the one incapable of penetrating glass, and therefore wholly stopped by the first screen; the other capable of so doing, and therefore readily transmitted through any number of screens.

If, however, he observes, the same effect is produced at temperatures below luminosity, this explanation fails; and either De la Roche's idea of polarization, or some other, must be resorted to; and it is to the examination of this case that the experiments detailed in his paper are devoted.

His apparatus consisted of two tin reflectors, opposed to each other, and having in the focus of one a blackened thermometer, and in that of the other an iron ball heated to redness, and cooled till it ceased to be visible in the dark. The indications of the thermometer were observed; first, for the direct effect; secondly, with one glass screen interposed; thirdly, with two;—sometimes a mercurial, sometimes an air thermometer was used. The indications were noted after each half minute of exposure, till the thermometer ceased to rise. The temperatures acquired by the screens were also noted. The conclusions drawn by the author from a great number of such experiments are,—

First, That the fact observed by M. De la Roche is verified when the source of heat is below luminosity, as well as above it. For in all the trials a rise was observed to take place in the focal thermometer, much smaller with one than with no screen, and very small indeed with two. The diminution, however, occasioned by the second screen was proportionally much less than that occasioned by the first.

On analysing more minutely, however, the progress of the rise of the temperature from half minute to half minute, and comparing it, in the cases where screens were used, with the observed progressive

increase of temperature of the screens themselves, Mr. Powell is led to conclude that the rise of the focal thermometer, where screens are used, is not attributable to any new property acquired by the heat in its passage through the first screen, when two are used, or to any direct radiation through the glass where one only is employed, but is simply the effect of secondary radiation from the heated screens; and that this cause must have operated extensively, is evident from the circumstance, that the reflectors were placed in some of the experiments at 15 inches from each other, in others only at 12. In the latter case, the first screen was found to have acquired in some cases as much as 23° (centigrade) of temperature above that of the ambient air, its distance from the heated ball being 2 inches.

The author next proceeds to examine the interception of heat by *glass of extreme thinness*; in which case, according to Mr. Ritchie's experiments, heat from non-luminous sources appears capable of radiating through that medium when transparent, but not when rendered opake. His experiments were made with fragments of a large glass bulb blown to extreme tenuity, and either left transparent or blackened with soot; but their results proved unfavourable to Mr. Ritchie's conclusion, no difference having been observed between the effects of thin and thick glass sufficient to warrant any difference in their mode of transmission.

The Bakerian Lecture. On the Relations of Electrical and Chemical Changes. By Sir Humphry Davy, *Bart. P.R.S.* Read June 8, 1826. [*Phil. Trans.* 1826, *p.* 383.]

The author prefaces the experimental results and investigations in this lecture with a brief historical statement of the origin and progress of electro-chemical science, with a view to correct the erroneous statements which have appeared in this country and abroad. In this the first origin of this branch of knowledge is stated to be the discovery of the decomposition of water by the voltaic pile by Messrs. Nicholson and Carlisle in 1800. This was followed by the experiments of Cruickshank and of Dr. Henry, and by several papers by the author himself, the chief contents of which are stated, and in which the appearance of acids, oxygen, and azote at the positive, and of alkalies, sulphur, and metals, at the negative pole, is shown.

The experiments of Hisinger and Berzelius in 1804 are placed next in order, which establish similar results; and in 1806, on the occasion of the agitation of the question respecting the formation of muriatic acid and fixed alkali from pure water, the author presented to this Society his Bakerian Lecture on the chemical agencies of electricity, in which he drew the general conclusion, that the combinations and decompositions by electricity were referrible to the law of electrical attractions and repulsions,—a theory in which, he observes, he has hitherto found nothing to alter, and which, after a lapse of twenty years, has continued, as it was in the beginning, the guide and foundation of all his researches.